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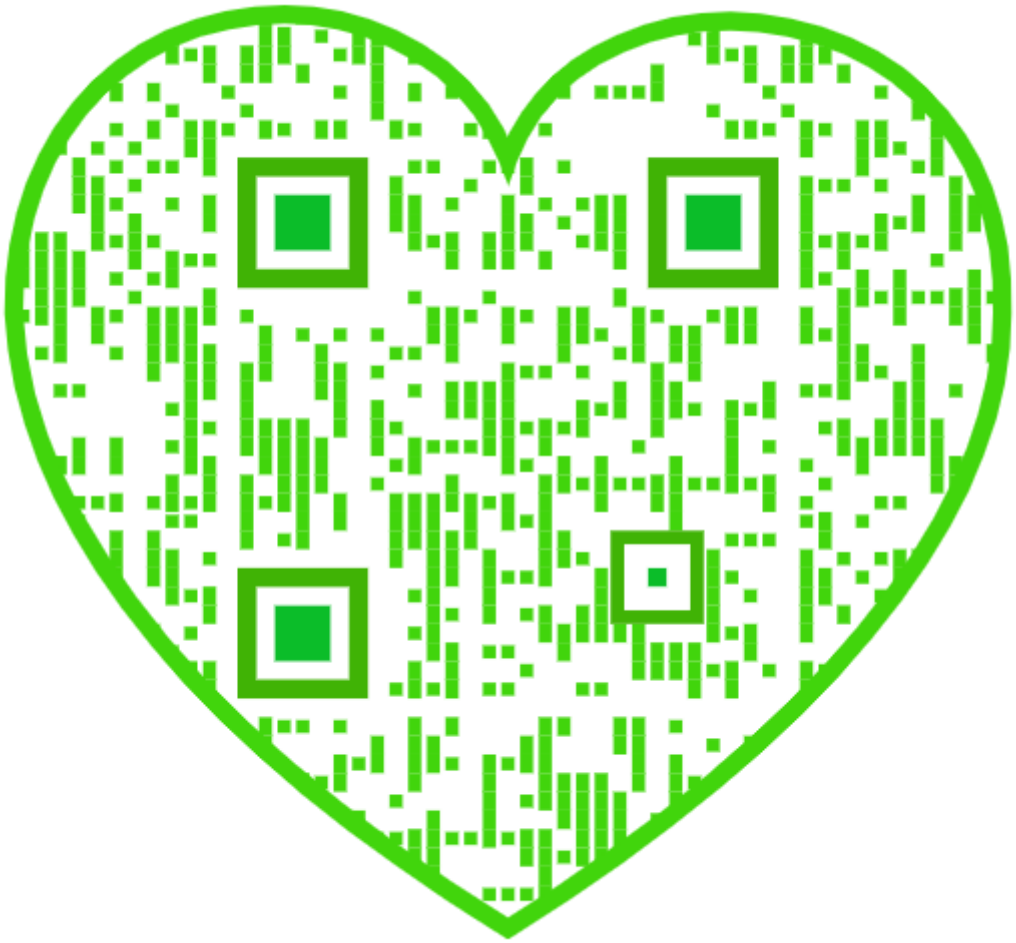

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# ESSAYS

ON

# THE SOILING OF CATTLE,

ILLUSTRATED FROM EXPERIENCE;

AND

## AN ADDRESS,

CONTAINING SUGGESTIONS WHICH MAY BE USEFUL TO FARMERS.

By JOSIAH QUINCY.

THIRD EDITION.

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# PREFATORY NOTE.

The first of these Essays and the "Address" were prepared, in 1819, at the request of the Trustees of the Massachusetts Agricultural Society. The second Essay was prepared, in 1852, at the request of the Trustees of the Norfolk Agricultural Society. They are now republished at the solicitation of friends of agriculture, and of the system therein recommended.

In former days in Massachusetts, when there was much land and few inhabitants, the possession of fifty or a hundred acres was thought requisite for the success of a farmer; and the possession of *ten, fifteen,* or *twenty* acres was scarcely deemed a title to that appellation. Time is rapidly changing these views; for land begins to be dear, and cultivators many. If Massachusetts means to retain her population at home, and preserve somewhat of the proportion of weight she yet possesses in our Union, she must study, act upon, and encourage the productive power of land, and inculcate on her agricultural class that the true interest, both of the State and individuals, is best promoted by cultivating small tracts of land to the utmost productive power of the soil. By a mistaken notion, that a considerable extent of land is requisite to enable a farmer to keep many head of cattle, a most wasteful proportion of it is retained for the sole purpose of pasturage; and thus, compared with its inherent productive power, made useless. If only the interest of the market

value of such comparatively useless tracts was applied to the cost of labor for highly cultivating small portions of land, and that which is now kept for pasture permitted only to grow up for wood, the profit to the State and individual would be in an important degree increased.

The aim of the ensuing treatises is to illustrate from experience the means and the mode, under the climate of Massachusetts, of accomplishing this result.

JOSIAH QUINCY.

Boston, March 1, 1859.

# ESSAY I.*

THE practice of "soiling cattle," as it is called, or keeping them, all the year round, in their stables, with only a daily and short liberty of a yard, having been a frequent subject of the attention, and an object of a proffered premium, by the Board of Trustees of the Massachusetts Society for promoting Agriculture, I shall, in conformity with their request, communicate my own practice and experience on that mode of managing stock.

Previously, however, to stating any observations upon the results of my own experience, I think it may be useful to abstract and digest into a regular form some of the principal facts and reasonings of Transatlantic farmers. These may tend to attract the attention of our practical husbandmen more forcibly to the subject; and enable those, whose farms and capital are in a condition that authorizes the adopting of this mode, to do it with more facility and success.

There are six distinct advantages which those who advocate soiling propose to themselves by the practice, and on

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which they establish the preference of this mode to the common one of pasturing cattle during the summer.

1st. The saving of land.
2d. The saving of fencing.
3d. The economizing of food.
4th. The better condition and greater comfort of the cattle.
5th. The greater product of milk.
6th. The attainment of manure.

The only offset to all these advantages is the labor of raising and cutting the food, and feeding and taking care of the stock.

1st. *The saving of land.* In relation to this fact, there can be no question. All European writers assert it. They differ only as to the degree of saving which results. Some assert that it is as *one* to *three;* others, *one* to *seven.* Others assert the saving to be yet greater: that is, *one acre kept for soiling will go as far as three or seven kept for pasture, in the support of stocks.* It is not important to analyze this point farther. For every practical purpose, the evidence is sufficient to satisfy every mind that a very great saving of land results from this practice; and that on farms, *where the whole soil is capable of being ploughed,* the economy of soiling is great: and on all such farms may profitably be adopted, provided that the expenses incident to the mode do not counterbalance these advantages.

It may be, however, useful to observe, that the reason of the diversity of statement, in relation to the degree of saving, among European writers, results from the different ways in which the land used for soiling is cultivated for

the purpose of raising food. Some satisfy themselves with enriching the former pasture, and cutting the grass it produces, for the soiling use. Others plough up the pasture; raise cabbages, or other succulent food, on which they support their stock. Now, it is plain, the result of a comparison of saving of land made between an acre of enriched pasture, and an acre appropriated to the latter of these modes of husbandry, must be very different.

In either case, the economy is sufficiently great; and, if nothing else be an offset for the advantage, this must be decisive.

2d. *Saving of fencing.* Here, also, is a great and decided economy. It includes not only the saving of the material used for fencing; the labor of making the fence, and of keeping it in repair; but also of the land occupied by the fences, and of all the headlands which are necessarily left on each side the fence, and which are usually an apology for slovenliness and a refuge for vermin. I have seen no precise estimate of this economy. Nor does it seem to be practicable to be made, upon any principle applicable to farms in general. It will be obviously greater or less according to the previous condition of the fences, and the ordinary necessity of erecting such as are usually deemed requisite on each particular farm. Here, also, the greatness of the economy is everywhere so obvious as to render any particular calculations unimportant. The general effect of soiling cattle is *to render all interior fences absolutely useless*, excepting those which surround the buildings, and lead from these to the highway. A farm thus relieved from interior fences not only enjoys all the exemptions from great actual and great annual expenditures; but also there are

other facilities in its management, resulting from this absence of interior fences, which are obvious and considerable. There is no waste land. The whole may be divided into cultivation, with precise reference to the state of soil. When the plough runs, the length of the furrow is determined only by the judgment of the proprietor. It presents to the eye a scene of cultivation, neat, orderly, and beautiful.

3d. *The economy of food.* There are six ways by which beasts destroy the article destined for their food, — 1. By eating; 2. By walking; 3. By dunging; 4. By staling; 5. By lying down; 6. By breathing on it. Of these six, the first only is useful. All the others are wasteful.

By pasturing, the five last modes are exercised without any check or compensation. By keeping in the house, they may be all prevented totally by great care, and almost totally by very general and common attention.

It is on the saving resulting from this prevention of waste that much of the economy of this mode of keeping beasts depends. In pastures, whatever is trod upon, or is affected by their dung or their urine, is lain upon, or even long breathed upon, is lost. And this waste is always in proportion to the richness and the productive power of the pasture; for just in that proportion is the quantity of food injured by all the five modes of destruction above stated; whereas the same, being cut and delivered to them sparingly in point of time, but sufficiently in point of quantity, will every particle of it be consumed. Besides, it is found by experience, that, in this mode of feeding, beasts will eat many products of the earth, in the stall, which they will absolutely reject in the pasture.

4th. *The better condition and greater comfort of the cattle.*

The condition of cattle will always depend chiefly upon the quantity and the quality of the food, and regularity of their supply. In all these respects, feeding in the stall has the advantage of pasturing; because, in stall-feeding, all are under the guidance of intelligence and discretion, and nothing is left to accident; whereas, in pasturing, the beasts are left to their own care. When the pastures are good, and there is a great surplus of food upon them, the difference is not, in this respect, great; but as soon as the pastures become "pinched," as it is called, by drought, the difference is always perceptible. Farmers who pasture their cattle, seldom, if ever, provide a supply of succulent food, to be in readiness in case of any accidental deficiency of pasture. The consequence is, that, on the pasturing system, the summer condition of cattle always depends wholly on the state of the pastures. Now, as every farmer, where he is able, does and ought to stock his pastures up to their full pasture-power, it follows, that even a small drought will affect the condition of the animal something, and a severe one very sensibly; a fact of which every man may convince himself by observing cattle at pasture in dry seasons. Now, one great benefit resulting from stall-feeding is, that it makes the condition of cattle, in as great a degree as possible, independent of variations of the season; and although an absolute independence is impossible, yet it is always much greater in stall-feeding than it can be in any mode of pasturing.

The want of sufficient exercise, which is inseparable from this mode of feeding in stalls, is a popular, and, when not

tested by fact, is deemed an unanswerable objection. Yet all those who have made the experiment, and whose opinions I have seen expressed upon the subject, are unanimous in declaring that no ill effect results from this circumstance. One writer asserts that he has kept a large herd for several years in this way; and, during the whole time, "he never had an animal essentially sick, had never one die, and had never one miscarry."

It is to be observed, that stall-feeding of cattle does not imply keeping cattle in stalls or in the house *the whole* time. It only intends always feeding them there, and keeping them there the chief of the time. On the contrary, it is an essential part of the system to let them loose in yards well shaded, either artificially or by trees, at least two hours in the forenoon, and as many in the afternoon. Here they lay themselves at their ease, in the best ruminating attitudes; or move round, taking some exercise in that act, or in rubbing themselves against posts provided for the purpose. If any person will observe the slowness with which cattle usually walk in their pastures: that while, in feeding, they do little more than stand; and, when full, that they almost invariably lie down, — he will hardly believe that the difference between the exercise thus attained, and that which they get by having four hours in the day exclusively devoted to that object, can scarcely materially affect their health. When to this is added the consideration, that, when fed in the stall, they are wholly protected from eating any noxious vegetables: from drinking bad water; from all injury: from being worried by dogs, or one another; that they are kept, through the heat of the day, in the cool shades: under cover; protected from flies, — it cannot be a question

that this mode is far more conducive to the health of the animal than pasturing possibly can be. Experience is also decisive upon the subject. If the condition of the animal be, as is here shown, better, it follows that this state must be more comfortable; for the one is dependent on the other.

5th. *Greater product of milk.* Although it is generally stated that this is the case, yet I do not recollect having met with any precise comparison upon the subject. The general apprehension among farmers seems to be, that although the condition of the animal may be better, yet that the tendency of the food to milk is not so great as when they are permitted to range in pastures. The truth, however, upon this point, can easily be explained, and in a manner perfectly conformable to my own experience. During the flush of feed (that is, for perhaps the first month after cattle are turned to pasture), there is little difference, as far as respects the milk product, between pasturing and stall-feeding. At that time, there is generally a great supply of food. The cattle are eager after it. They have great opportunity to select. They feed quietly, and take only the most nutritious and palatable. After this month, this equality will gradually cease, and in favor of the stall-feeder. The pasture-food almost always grows more or less scarce, according to the particular character of the season; whereas, by taking care to provide a regular succession of succulent crops, he who feeds his cattle in stalls may keep the milk product, unaffected by the state of the season, to the end of the autumn.

6th. *The attainment of manure.* This is a great and characteristic benefit resulting from soiling, or stall-feeding, of cattle through the year. In pasturing, the summer

manure is almost wholly lost. It falls upon rocks, among bushes, in watercourses, on the sides of hills. It is evaporated by the sun. It is washed away by the rain. Insects destroy a part. The residuum (a dry, hard cake) lies sometimes a year upon the ground; often impeding vegetation, and never enriching the earth in anything like the proportion it would do if it had been deposited under cover, and kept free from the action of the sun in appropriate and covered receptacles, to be carted out annually in the proper season, and ploughed at once under the surface.

The gain by this saving of the summer manure of beasts is stated by European writers, but generally loosely, and often in measures of quantity or capacity not easily reducible to those which prevail in our country. It is, however, unequivocally very great and important, and well worthy the solicitude of every farmer. As the great object of every farmer ought to be to increase his quantity of manures, there can be no mode preferable to the one here suggested; for, suitable receptacles or recipients being provided, everything of the nature of excrementitious matter is preserved and deposited in the soil at the leisure and at the discretion of the farmer.

It was the conviction, resulting from the preceding facts and statements, which led me to adopt, two or three years since, the idea of putting my farm into this mode of management. The particular situation of it seemed to point it out as precisely suited to such a mode of conduct. It is a level plain, constituted of alluvium upon clay, occasionally intermixed with lighter quality of soil. It had no fences but post and rails; so that, by adopting this mode, it might be wholly relieved from interior fences, the expense of which

had always been a heavy item in my farm-accounts. For the three years past, I have been in this practice; during the two former years, with some occasional deviations; during the last, regularly and systematically, without any deviation. The result has been all that I anticipated, in every respect. Indeed, it has been so satisfactory, that I think no considerations would induce me to adopt a different mode in the management of my stock.

The result of my experience has been perfectly conformable to the statements made by European writers.

My stock has been uniformly healthy; in a condition generally superior to my neighbors', all of whom pastured their cattle. In point of milk, during the flush of feed in June, the product was not inferior to any, according to the number of my cows, with which I had an opportunity to compare. In July and August, in my vicinity, the drought was severe, and the milch cows in my neighborhood fell off in their milk nearly, and some quite, a half. Mine were kept during the whole season without any sensible diminution which could be attributed to the want of food or its quality. The cows throve, and showed no marks of discontent. None were materially sick. I lost none.

With respect to stock, the practice upon my farm had been, from almost time immemorial, to keep from ten to fifteen head of cattle. For the support of these, *about fifty acres of land* were appropriated during the summer months; besides which, they were permitted to range in the autumn over the mowing. The result was, that, in good seasons, the stock throve, and were kept well. When the seasons were dry, they fared badly. When the drought was severe, they were shut up, and fed upon cornstalks or hay. This

was the usual course. And the practice and the result is, at this day, very similar in all my vicinity.

My practice, and the result of the past year, were the following: —

My stock, consisting at an average of twenty cows, were kept in their stalls through the whole year. The practice was to feed them about six times in the day, and to permit them to range in a yard, about eighty feet square, two hours in the forenoon, and two in the afternoon. They were kept well littered and well curried. While they were out of the stable, the attendant took that opportunity to clean the stalls and to supply fresh litter. During winter, they were fed, as is usual, with salt and fresh hay and vegetables. From June to November, inclusive, may be considered, strictly speaking, the soiling season; by which is understood that in which they are fed with green food in the house. As this is the critical period, I shall be minute in the account of my preparations and proceedings.

In the autumn preceding, I had caused rye to be sown upon an inverted sward, very thick, on about three acres. Early in April, I prepared and sowed, in manner as shall be stated afterwards, about three acres and one quarter of land with Indian corn in drills. I also sowed about three acres of oats and buckwheat, broadcast, at the rate of three bushels to the acre, about the latter end of the month. The whole quantity of land I thus prepared to be used in soiling, in aid of my grass, did but little exceed nine acres. Of these, that which I sowed with rye turned out so poorly, that I never soiled from it more than five days; so that, in fact, the land thus prepared did, in efficiency, but little exceed six acres.

About the 1st of June, cattle, in general, were, this season, turned out to pasture. On the 30th of May, my farmer began to cut the sides of the road leading to my house from the highway and orchard. He continued to soil from this, and from grass growing in my orchard, until the 7th. On this day he abandoned cutting the grass for soiling, and began to cut from the winter rye. This was found too tough, and it was quitted; and my farmer returned to soiling upon grass. Having cut over all the refuse of my grass by the 24th of June, he then went into the poorest of my mowing land, and afterwards into my clover. From this he continued to soil until the 6th of July. By this time he had gone over not much short of three acres of mowing land. On the 6th of July, he began to soil from my oats. He continued to soil from these until the 21st of July. On the 21st of July, he began to soil on Indian corn; on which he continued until the 26th, when he began to cut about two acres of late and light barley. On this he continued until the 30th of July; when he recommenced soiling on corn-fodder, and continued upon it until the 31st day of August. On this day began to cut over the road-sides, which had been first cut early in June. This was continued only to the 2d of September; when he began to cut the second crop of Indian corn growing upon the three and one fourth acres of Indian corn, which had now shot up in great luxuriance from the roots of that which had been cut over between the 21st and 26th of July. On this soiling continued until the 8th of September.

On the 9th and 10th, he soiled upon about a fourth of an acre of millet and buckwheat; on the 11th, soiled on a second crop of clover; from the 12th to the 15th, inclu-

sive, on cornstalks of about an acre of sweet corn; and, on the 16th, on a patch of millet and oats. This was continued to the 20th; when he began on two acres of Indian corn, sown in drills, on the 1st of August, on land from which a crop of pease had been previously taken. Soiling was continued on this corn until the 3d of October. From this time until the 15th of October the soiling was wholly from second-crop grass taken from various parts of my mowing land.

From the 15th of October to about the 20th of November they were kept wholly upon carrot and turnip tops, arising from the topping of about twelve acres of both; being allowed always one foddering of salt hay. This finished the summer feeding. From this time they are kept wholly upon salt and English hay. The result, then, of this experiment, so far as relates to land, is the following: —

The twenty head consumed the product of

| | | |
|---|---|---|
| $2\frac{1}{2}$ | acres, | road-sides and orchard. |
| 3 | " | mowing land. |
| $3\frac{1}{4}$ | " | Indian corn, cut as fodder. |
| 2 | " | late and light barley. |
| 3 | " | oats. |
| 2 | " | late sown Indian corn after a pea-crop. |
| $\frac{1}{4}$ | acre | buckwheat. |
| 1 | " | millet, buckwheat, and oats. |
| 17 | acres. | |

This is the whole land which was cut over for soiling, with the exception of the after-feed on the mowing land, and the tops of carrots and turnips. In comparing this result with the former practice of my farm, I apprehend the following statement to be just: —

I offset the keeping from the 11th of September to the 20th of November against the old manner of letting the cattle run at large during the autumn months on the mowing land, to its great injury, by poaching and close feeding. If this should not be deemed sufficient, I then make no estimate of the difference between keeping fifteen head of cattle, the old stock, and twenty head of cattle, my present stock. After these allowances and offsets (which no man can doubt are sufficiently liberal), then I state that my experiment has resulted, in relation to land, in this, that I have kept the *same amount of stock, by soiling on seventeen acres of land which had always previously required fifty acres.* The result is, in my opinion, even in this respect, greater than what is here stated. This, however, is sufficient to exhibit the greatness of the economy of this mode, so far as relates to land.

With respect to saving of fencing, the previous condition of my farm was this. I had, at the lowest estimate, five miles of interior fence (equal to sixteen hundred rods), which, at one dollar the rod, was equal, in original cost, to sixteen hundred dollars, and annually, for repairs and refitting, cost sixty dollars. *I have now not one rod of interior fence.* Of course, this saving is great, distinct, and undeniable.

In relation to manures, the effect of soiling is not less apparent and unquestionable. The exact amount of summer product I have not attempted to ascertain: but I am satisfied, that, everything considered, it is not less than one buck-load per month per head; or, on twenty head of cattle, one hundred and twenty loads for the six soiling months. In this estimate, I take into consideration the advantage

resulting from the urine saved, by means of loam, sand, or some imbibing recipient, prepared to absorb it.

It remains to show that the cost of raising the food, cutting it, and distributing it to the cattle, is compensated by these savings. Upon this point, my own experience has satisfied me, that the value of the manure alone is an ample compensation for all this expense; leaving the saving of land, of food, and of fencing-stuff, as well as the better condition of the cattle, as a clear gain from the system. As an evidence of this, I state my expenses for labor in conducting the soiling process.

During the month of June, I hired a man to do everything appertaining to the soiling process; that is, cutting the food, delivering it, taking care of the cattle in the daytime, for fifteen dollars the month, he finding himself. In this arrangement, it was estimated that I availed myself of half his labor. At the end of the month, I had the manure measured: and I found that the manure collected in my receptacle (which was a cellar, under the barn), and not including that which had been made during the four hours each day in the yard, amounted to fifteen loads, — a quantity of manure which I could not have placed on my farm for thirty dollars; and which I could have sold there for twenty dollars, upon the condition it should be carried away. It cost me, as above stated, fifteen dollars in the labor of the attendant.

During the remaining five months, I added another man, because I found that a great economy in vegetable food would result from cutting it into pieces by a cutting-knife, and mixing with it about one third of cut salt hay or straw. This was done: and I kept an accurate account of all the

labor of cutting the food in the field, bringing it into the barn, cutting it up there, cutting salt hay or straw to mix with it, mixing this food, and delivering it to the cattle; and found that it amounted to one hundred and forty-eight days' labor. This, estimated at a dollar the day, is one hundred and forty-eight dollars; to which adding fifteen dollars paid for labor in the month of June, the whole expense was one hundred and sixty-three dollars.

The manure, at the end of the soiling season, certainly equalled one hundred and twenty loads; and could not have been bought, and brought there, for three hundred dollars. Let it be estimated at only two hundred dollars in value. No man can question, I think, the correctness of my assertion, that the value of the manure obtained is a clear compensation for this amount of labor; and this including all the expense of labor connected with soiling.

It remains to be shown in *what* manner the whole process ought to be conducted by any one who may originally attempt it, and also *how far* it is applicable to the farming condition of New England, and what species of farmers would find their account in attempting it.

As to the manner in which the soiling process ought to be conducted, besides that general care and personal superintendence (at least occasionally, and by way of oversight) which is essential to success in this as in every other business in life, three general objects ought to claim the attention of every farmer or other person who undertakes this process.

1. Provision against seasons of extraordinary drought, or deficiency of general crop from any other natural accident.

2. Succession of succulent food during the whole soiling season, and facility of its attainment.

3. Preparation relative to care of the stock, and increase of manure, — the particular objects of the soiling process.

As to provision against seasons of extraordinary drought, or deficiency of general crop from any other natural accident, I make this suggestion from respect to an obvious dictate of prudence, rather than because such has been my own practice. In fact, I have never made any such provision. Years of uncommon drought, or sterility from other causes, are so uncommon in our country, that I have hitherto neglected, and without injury, this plain suggestion of prudence. As a general rule, however, a farmer commencing and adopting this plan would act wisely to keep on hand a month or six weeks' stock of hay or other food, so as to have assurance that his cattle should not suffer from any untoward accident of season. A mixture of dry food with the succulent is often very conducive to the health of the animals soiled, and enables the feeder to check the too great looseness of the bowels, — often the effect of high feeding upon succulent vegetables.

Some provision of dry food against such exigency, and for such purposes, is wise, as a dictate of foresight. It is also as a dictate of economy, as some mixture of dry food with succulent makes the latter go much farther; and, on very stormy days, enables the feeder to preserve the general and desired state of the cattle soiled with less personal exposure.

As to the second general object of attention, — succession of succulent food during the whole of the soiling season, and facility of its attainment. This includes, —

1. Nature of the crop used for soiling.
2. Time and mode of sowing and cultivation.

3. Mode of taking and applying the crop, and the relative location of the ground, used for soiling, to the place where the cattle is soiled.

1. As to the nature of the crop used for soiling. This must, of course, be different in different climates. The English speak of lucern, clover, pease, cabbages, as used for this purpose. Of all these, clover is that which is the most capable, in this country, of being made useful in this system. Unquestionably, however, any succulent vegetable which cattle consume may be used, according to the discretion which acquaintance with its nature dictates. Without dilating, generally, on the applicability of all of these vegetables, and leaving every farmer to take advantage of these and every other he may deem useful and find convenient, I shall state my own practice and experience.

These have led me to simplify and reduce the number of vegetables used, for the purpose of making the cultivation and effect of each species selected a distinct subject of consideration, and for the enabling me to have the great supports of the system well established This effected, it is easy to change and to deviate into other vegetables, or to introduce them in aid of those on which any one chooses principally to rely. In making my selection, I was guided by the nature of the climate, and by the consideration of the vegetable selected being the best known and most successfully cultivated in the neighborhood. I use but four, — 1st, grass; 2d, oats; 3d, Indian corn; 4th, cabbages.

1. Grass. I depend upon this for the first month of the soiling season; beginning, in our climate, about the 20th of May or 1st of June, and terminating about the 1st of July.

In my own practice, I have contented myself with com-

mencing soiling at the time at which cattle are, in this climate, usually turned out to grass. It would be wise, and, I apprehend, easily practicable, to introduce some vegetable, which, sown the preceding year, would enable the farmer to commence cutting earlier, and so carry back the commencement of the soiling season to the 1st of May, possibly earlier. This, however, I have never attempted; partly because it required personal attention which I could not give, consistent with my other avocations; and partly because, in the commencement of the system, I thought it wise to limit my experiments to the period in which cattle are usually kept upon pasture; leaving it to future experience to enlarge the benefits and length of the soiling season; fearing lest, by attempting too much, I might be discouraged, and by failure, in part, might put to hazard the great objects of the system which are attained when vegetables taken for soiling are made a complete substitute for vegetables fed by the cattle themselves from the pasture. For the first month, therefore, of the soiling season, I depend upon grass.

Concerning the quantity of land in grass necessary to be applied to the support of any specific number of cattle, I have no experience sufficient to state it with accuracy. My own practice has been to cut from the earliest grass I could find in small pieces and patches about my house, and by sides of an enclosed road, of which I could not easily take an exact measurement. Minute calculations on this point must obviously be very uncertain and unsatisfactory; as the capacity of every given piece of land to support any specified number of cattle must depend upon its heart, and state of cultivation. It will be sufficient to say, that my own ex-

perience authorizes me to state, that one acre of good clover or any early grass, cut for soiling, is ample for the support of six head of full-grown cattle from the 20th of May to the 20th June. As it is best, however, in all calculations of this kind, to provide against all contingencies, my rule is to consider *one quarter of an acre* of my best grass-producing land as appropriated to each head of soiling cattle, for its support between the 20th May and 1st of July. Less than that quantity has always been sufficient on my farm. If it be not used for soiling, the produce is housed as hay for the winter.

Small farmers who should top-dress the land, every day cut over, with the water leached from the manure-heap, would reduce the extent of land, required for the process of soiling, very considerably.

It is needless to give any directions, relating to any particular preparation for the soiling process, for this first period. What is required is only land in its best grass state, — good mowing land, — to be reserved at the rate of a quarter of an acre for each head of cattle soiled, and for the facility of feeding and of manuring for after-feed as near the barn where the cattle are kept as possible.

The preparation of oats, Indian corn, and cabbages require somewhat more particular attention.

Preparation of soiling food, in April, for July. First, of oats. These are, on my farm, made to succeed grass; and usually afford a good cut about the 1st of July. As it is important, in every plan of husbandry, to simplify as much as possible, I shall consider oats as the food exclusively destined for the month of July; although, in fact, at the latter part of the month, Indian-corn stalks may begin to be cut;

and had often better be commenced, not only for the sake of diversifying the feed of the stock, but because the corn-stalks cut in the latter part of this month will be more likely to vegetate anew with luxuriance than if cut later.

With this explanation, I state oats, cut in the milk, to be the food, in this climate, for the support of the soiling process in July. As it is important to get the cattle off of the grass-land as soon as possible, to the end that the winter crop of hay may be the more abundant, so the preparation for oats ought to be as early as possible. It will be best if the land have been thoroughly ploughed the autumn preceding. It ought to be land in excellent heart, — all my calculations being made on land in such a state; it being obvious that calculations on any other must be altogether uncertain, and various in result. It ought, also, to be land which had been cultivated and well manured the year preceding. As soon as the frost is out of the ground, it should be ploughed at least once, and the oats sowed broadcast, at the rate of four bushels to the acre at least. The land should then be harrowed and rolled. Oats thus sowed at the earliest moment possible will generally be ready for the scythe about the 1st of July.

As to the quantity of land thus to be prepared. One acre for every four head of cattle soiled (that is, one quarter of an acre for each head) will be sufficient. At least, such has been invariably my experience, where the land is in proper heart and tilth. In order to test this point, I have not only observed and compared the general extent of land cut over with the whole number of cattle soiled, but also have more than once had the quantity eaten by a certain number of head in a certain number of days, on a measured extent,

compared. The result of my experiment is, that *one square rod of oats, in full milk, growing on land in proper (that is, high) tilth, will support one head of cattle a day.* One quarter of an acre, or forty square rods, for thirty days, is a fair basis of calculation, and making a sufficiently liberal allowance for accident.

In the outset of attempting this system, I should recommend somewhat enlarging this quantity; that is, sowing somewhat more than a quarter of an acre for every head of cattle soiled.

1st. Because, in farming, as little should be left to chance as possible.

2d. Because nothing is lost. If there be an excess, it may be cut and dried for winter food.

3d. Because the necessity for beginning to cut a little before the oats are in full milk, and sometimes of extending the cut a little after that period, will affect the general result of all calculations relative to the productive power of the land.

In reference to the fact, and upon the supposition on which we are now proceeding, that oats alone, without aid from any other product, are relied upon for the whole month of July, the sowing ought to be successive: viz. one half the destined quantity of land as early as the seed can be got into the land; the other half a fortnight later, so that the crop may have some succession. It would be probably better if the whole extent destined were divided into fourths, and sowed, each fourth, with a week or ten days intervening. Thus, supposing the number of cattle soiled to be four, requiring one acre, according to my practice; and one quarter should be sowed on the 1st of April, one quarter

on the 8th, one on the 15th and 22d. My own practice has not been thus subdivided. I have found one sowing about the 10th, and one about the 15th, to answer.

2d. Indian corn. This, according to that simple plan of conducting the soiling process I am describing, is to be relied upon for food during the month of August.

The estimate made concerning the capacity of land in oats to support stock, may, for all practical purposes, be assumed to be the same when in Indian corn; that is, a quarter of an acre to support one head for the month. Somewhat more than that quantity to be sown per head, for the same reasons as those stated in relation to oats; the land to be in the same heart and tilth; to receive, at least, one ploughing and harrowing about the latter end of April, and in the beginning of May; after which, light furrows should be run three feet asunder, at the depth of three or four inches. In these furrows corn should be sown broadcast, about the thickness, and in the same manner, as pease are sown, in field culture of them. The corn may then be covered by the plough; although, in my experience, a harrow drawn lengthways, and then crossways, followed by a roller, is sufficient, and to be preferred, for this operation.

If the farmer choose, and his fund of manure permit, the furrows, previous to planting, may be lightly strewed with manure to obvious advantage. This, however, has not been my practice. Grain of any kind, not permitted to seed, but little exhausts the land; but, if it be repeated, it will require, of course, some provision of manure to prevent its deterioration. He, however, who carries on a soiling system upon any important scale, will never want for manure.

Corn thus sown will be ready to cut the latter end of July and the beginning of August. The whole month of August, I have found Indian corn, cut in the stalk, the best soiling food. If, however, the farmer prefer to give a variety, he may sow a part of the land in oats instead of corn, and alternate through the month of August on oats and Indian corn.

In the middle of May, in the beginning and middle of June, and even as late as the 1st of August, in our climate, a portion of land, proportionate to the number of cattle, should be sowed in like manner, on which soiling may be continued during the whole month of September. In this month, however, reliance may be placed upon the grass of the second crop from those acres from which soiling was effected in the month of June. The grass of the second crop will generally enable the farmer to soil to the 15th of October, if his grass-land be in proper tilth and heart.

After the 15th of October, to the beginning or the middle of November, the tops of his winter vegetables, such as carrots or turnips, — and which, in every good system of farming, should be raised in proportion to the stock kept, — should be relied upon.

After which, cabbages should succeed until the time when all cattle are housed in this climate.

Reduced to a single statement, my experience and system is, for the support of my soiled stock during the months of July, August, and September, to sow, in the months of April, May, June, and July, equal to three quarters of an acre of land for each head of cattle soiled, in such succession as will give also a regular succession of succulent food in the three first-mentioned months.

For their support from the 20th of May, and during the month of June, I reserve early clover or other grass, at the rate of one quarter of an acre for each head of cattle soiled.

For their support during the first half of October, I depend upon the second growth of the half-acre cut over in May and June, and the second growth of the oats and corn cut over in July.

This period, between the 20th May and the 15th October, is the only one on which I rely on grass, oats, and Indian corn; and includes a reservation and employment of land equal to one acre per head of cattle soiled.

My own experience has been always less than this; never having exceeded, as I believe, seventeen acres for twenty head; and those never in that state of high tilth which in this systematic statement I recommend.

In truth, the capacity of an acre to maintain cattle in a soiling process, if conducted with due attention to develop its full powers, is probably four or five times greater than this. But I choose to raise no extravagant expectations. In the commencement of every new system mistakes will be made. Great diversities in quality or state of land must exist; and will, of course, occasion a diversity in result. Besides, the soiling process, beyond all others, requires vigilance and foresight. Cattle, in this process, are not left to range over an immeasurable extent of pasture, composed of grass, heath, rock, marsh, brush, and brier, about which the owner makes no calculation; sometimes stocking it beyond, and sometimes beneath, its power; in good seasons, keeping them well; in bad, affording them lean and scanty fare, scarcely sufficient to support life, and wholly inadequate to

a profitable return. In the soiling process, they are put under the care of intelligence. It must exist, and must be exercised. If this be the case, the reward from the system, on farms suited for it, is ample. For myself, after a trial of six years, no consideration would induce me to change it for the old method of pasturing.

It remains to explain the soiling system during the residue of the season, — viz. from the 15th of October to the middle or the latter end of November; at which time, stock, in this climate, usually begin upon their winter food. In my system, I have depended upon the tops of carrots and turnips destined either for the market or for the winter food of stock. My practice has been to raise from eight to twelve acres of vegetables; the tops of which, with a single foddering of salt hay per day, have been, according to my experience, sufficient to support equal to twenty head of cattle from the 15th of October to the middle or latter end of November.

If, however, the farmer is not in the practice of raising a sufficient quantity of roots to yield a support for his stock for six weeks, cabbages are, in this climate, the farmer's best dependence, after the second cutting of the grass, and corn and oat fodder fail.

The preparation for cabbages, in field culture, is so well and universally known, it needs no explanation. It is sufficient to say, that in suitable soil, well manured, a thousand plants, weighing upon an average fifteen pounds, may easily be raised on the eighth of an acre. These, at two hundred pounds per day per head, or thirteen and a quarter cabbages, will be sufficient for each head of cattle seventy days; which is ample for the support of each head to the 1st of December.

With respect to care of the stock, and increase of manure, — the particular objects of the soiling process. All the care of the stock requisite is keeping them clean, and currying them every day; throwing the manure into the proper receptacle; seeing that the cattle are regularly and sufficiently watered, and that they be permitted to be at large in a yard, of a common barnyard size, at least two hours in the morning, and two in the afternoon. The yard will be best if a part of it be shaded, or sheltered from the direct rays of the sun.

The food is distributed in racks, under cover or in the barn, about six times a day, in due proportions, which the usual practical knowledge of a farmer will easily regulate.

A cellar under the barn, or at least a covered receptacle for the manure, clayed at the bottom, or stoned, so as to be water-tight; to the end that the drainings of the manure should not escape in the subsoil. The yard and floor of the barn should also be so constructed as to direct the urine into such a covered, water-tight receptacle.

This is particularly necessary in the soiling process; inasmuch as the manure made by succulent food is rich and watery, and liable to be in a degree wasted by the action of the sun's rays in an open yard. But, when under cover, it is the richest of all manures of like species; and is qualified, beyond all others, to impart its riches to soil and earth thrown into the receptacle, and mixed with this summer's manure.

Hogs, also, should be permitted to range into it from the hog-pen, not only for the purpose of mixing the deposit together, but also on account of economy. In all soiling, some waste of green food is unavoidable, either from some-

times cutting more than can be consumed in the day, or from its being blown upon by the cattle. This, hogs consume, and prevent loss of it.

The increase of manure in this mode exceeds all anticipation. It is on this account that the soiling process claims the attention of farmers, who are always ready to say, "We can do well enough, only give us manure. The want of manure is our great want." This is supplied by the soiling process, in a mode cheap, easy, within the resources of every farmer, and leading, in its event, to the highest and most satisfactory of all methods of conducting a farm.

I have been the more minute in this statement; and shall not fail hereafter to communicate my experience in this system, because I apprehend it is peculiarly suited to the farming condition of Massachusetts; and although it is, at present, almost unknown, and wholly unpractised, — at least, I have never heard that it is as yet practised, upon any considerable scale, on any farm, except my own, — yet I am satisfied that it will gradually grow into use; and the sooner it can be made to be understood, and the way shown, the better for our Commonwealth. A farmer, now-a-days, who has but thirty or forty acres of land, feels himself, in some measure, straitened for want of room. He is tempted to buy pasture-ground, to widen his surface, perhaps to run in debt, and embarrass himself for life, for the sake of what he thinks the "*one thing needful*" for a farmer, — *much land*. When his sons come of age, if he cannot give them more than thirty or forty acres they must abandon their homes, the land of their fathers, and all the privileges of a cultivated and improved society, to seek a *great farm* in Western wildernesses.

Now, all this is mistake, and want of knowledge, of the productive power of the soil, when highly cultivated. The first step for farmers to take is to reverse their old prejudices in this respect; and, instead of calculating how much more land they want, let them try with how little they can do, and do well.

There is no proposition in nature more true, than that any farmer may maintain, upon *thirty acres of good arable land, twenty head of cattle*, in better condition with more profit, with more comfort to the animals, with less labor, less trouble, and less cash advance, to himself, than he at present usually expends upon a hundred acres. In addition to which, he will have the great satisfaction of seeing, in time, every square inch of his land productive; instead of seeing, as he does now, not more than one part in four of his farm producing anything; or, at least, anything that will pay the expense of harvesting.

But how is this practice to be introduced? I answer, Gradually. Let farmers "feel their way" into it. If any farmer thinks that he wants more pasture-land in order to keep more cattle in the summer, in order to consume his hay, or to make manure in winter, instead of running in debt, or laying out his money in more land, let him keep himself free of debt, or put his money out at interest, and try soiling. Let him be assured he will find his account in it. But how shall he try Shall he shut up all his cattle at once; enter upon a scheme recommended by book-writers; and perhaps fail, either from accident or misapprehension, the first year? By no means. Every practical farmer, if he be wise, will, on the one hand, never utterly slight the suggestions of books and writers on the subject of

his art; and, on the other, will never enter upon them at once, on any great and decisive scale. As the saying is, "he will always feel his way." Thus, for instance, in this case of soiling. A farmer, ignorant of the subject, yet willing to try the experiment, should commence with one or two head of cattle. Let him set aside, at first, two acres of land for each head. Nothing will be lost if there be an excess of the oats or corn, sown for soiling, beyond the consumption: the surplus, cut in season, will remain for winter's food. Let him go through, for one year, a course of soiling such as is suggested, for one or two head of cattle. Let him oversee the feeding himself, or by a confidential hand. A boy, if trustworthy, is sufficient for such an experiment, acting under the daily directions of his father or master. Let him provide a pit, or cellar, covered, or under the barn, or so placed in relation to the cattle soiled as that the manure and urine can be easily preserved; the cellar or receptacle being water-tight. If this be so situated as that his hogs can have fair play among the deposits, it is impossible but that he will find his account in it.

One year's success will enable him, and, I cannot question, will induce him, to double, if not treble, his next year's experiment. Soon he will, if the nature of his farm permit, shut up his whole stock; and ultimately will arrive at a state of conviction and feeling such as will never permit him again, on any consideration, to allow cattle to run at large on any of his land which is capable of being ploughed and mown.

I know it will be asked, What shall be done with rocky land, and land suitable only for pastures? My answer is, that where a farmer *has nothing else* but rock or pasture land

or sand, which cannot be made subject to cultivation, he must manage according to his condition. Good farming is making the most of land according to its nature. If a man have a sand-bank on the margin of the ocean, he can make salt; if nothing but some perpendicular mountain-rocks, it will be best, probably, to keep goats. So of the rest. Farming, to be good, must always have reference to the species and capacity of the soil.

The system I advocate has reference to *arable land; to that portion of it on every man's farm which is capable of being ploughed and moved over*. Every man who wishes to make the most of this part of his farm will effect this the most certainly, the most economically, and the most satisfactorily, by the mode I recommend. If a man have part pasture and part arable, he may soil for part, and pasture for part. There is nothing inconsistent in this: on the contrary, the soiling is a great support to the pasture; because, when the pasture fails (as in dry seasons it often will), a man who soils part will always provide a surplus of his soiling food to meet such a contingency.

In answer to the question, What species of farmers will find their account in attempting to soil? I answer, EVERY FARMER WHO WANTS MANURE AT A CHEAP AND EASY RATE. The greatest profit of soiling arises from the quantity of manure it enables the farmer to make; more than doubling it upon the same stock. It may be adopted, I apprehend, as an axiom, almost universal, — certainly so, except in cases of very great proximity to a town or village, — that soiling is the cheapest of all modes of obtaining manures. In this point of view, the saving of fence, the economy of land, of food, the increase of milk, and the better condition of the cattle, —

all of which have been shown to be the consequences of this method, —may be considered as incidental to the system, as an offset for the labor requisite; giving the manure made as a clear gain; and, what is more, without the loss and trouble and expense of carting from a distance. It is not only made, but it is placed, just where it should be, — in the farmer's own stercorary, or covered manure-heap.

The rich farmer and the extensive landholder ought to avail himself of it, *if he wants manure*. If he have capital, he may stock his pasture-land up to its full pasture-power, and keep a number of head additional on the soiling system, according to the quantity of manure of which he stands in need. But the conduct of a farm, upon a great scale of this nature, depends upon so many circumstances, that the particular mode or extent of applying this system, as subsidiary to pasturing, cannot be prescribed by any general rule. Calculations must have reference to a knowledge of all the particular circumstances and relations of such a farm and such a capitalist farmer.

To farmers who possess only ten, fifteen, or twenty acres of land, this system is peculiarly applicable. Upon this they may build up a most prosperous agriculture, with little capital, little more than ordinary trouble, and little or no risk; relieved from debt, which is so frequently the farmer's ruin, under the idea of the necessity of purchasing more land; and relieved, also, from the pain and vexation of owning and superintending a vast surface, — everywhere less productive than it ought to be; and, in a very great proportion, often not productive at all.

I have thus endeavored to give, according to the request of the Trustees, an account of the mode of my conducting

the soiling process, and the result of my own experience. It is now six years since I commenced it; and no consideration would induce me to abandon it. Every year brings new conviction of its facility and its productiveness.

If farmers would be persuaded to commence the system upon a small scale, with one or two head of cattle, they would gradually become acquainted with it; success would inspire confidence; until, enlarging the number of cattle soiled, they might, in time, easily keep one head per year for every acre of land they possess. Far greater than this would be the fair ultimate result of the system, if wisely conducted. Besides which, they would find other economies and advantages resulting from it, amply compensating for all the increased labor consequent upon the process.

# ESSAY II.*

*To the Trustees of the Norfolk Agricultural Society:—*

GENTLEMEN,—In conformity with your request, I proceed to state "my experience, practice, and views" on the subject of "soiling;" by which I understand the keeping cattle in the barn, and feeding them with green food, during the summer months; allowing them, daily, only a few hours' liberty of a yard, instead of feeding them in pastures. I do not, however, expect to communicate anything which may not easily be gathered from European writers. Knowing, also, the great proportion of land in the State thought to be exclusively applicable to pasturage, I do not anticipate that any statement on the topic can be generally useful. Yet to those farmers who have no land which may not easily be subjected to the plough, and to that increasing class who possess only *ten*, *fifteen*, or *twenty* acres of land, the system is very important, and a knowledge of my "experience and practice" may be useful.

Between the years 1813 and 1821, I managed my farm, according to my own judgment, with satisfactory success. My attention was easily drawn to the subject of "soiling"

* Published in the Transactions of the Norfolk Agricultural Society, for 1852, p. 107.

milch-cows in the summer season, instead of keeping them in pasture, from the following circumstances. My farm consisted of about one hundred and seventy acres of good loam, level, without stone; almost every square foot of which might be easily made subject to the plough, with the exception of about twenty acres, which were salt marsh. Nearly half of it had been always applied to pasture; and had upon it, by estimate, four or five miles of interior fence, which could not have cost, originally, less than sixteen hundred dollars; and, being post and rail, annually cost about sixty dollars in repair. My farm being compact, the annoyance of having fifteen or twenty head of cattle driven night and morning to and from pasture; the loss of time in turning the plough owing to the number of interior fences; and the loss of surface capable of being submitted to the plough, owing to the many headlands, — all drew my attention to the subject of "soiling" and its effects.

I found that European writers maintained that six distinct advantages were to be obtained by the practice of "soiling" over that of pasturing cattle in the summer season.

1. It saved land.

2. It saved fencing.

3. It economized food.

4. It kept the cattle in better condition and greater comfort.

5. It produced more milk.

6. It increased, immensely, the quantity and quality of the manure.

Satisfied, in my own mind, of the beneficial effects of the practice, I adopted it in the year 1814, and adhered to it until the year 1822; keeping from *fifteen to twenty* head of

milch-cows with such satisfactory success, that in the year 1820, at the request of the Trustees of the "Massachusetts Society for promoting Agriculture," I published, in their journal, an essay "on soiling cattle."* In the year 1822, I gave up the direct management of my farm, and leased it, from considerations wholly independent of any dissatisfaction with this practice or its results.

From that time being occupied in various public offices in Boston and its vicinity, I exercised no superintendence of my farm for about twenty-five years. Resuming its management in 1847, I immediately returned to the practice of "soiling;" resorted to the Essays I had formerly published, to revive my knowledge on the subject; and, from that time to the present,† have persevered in the practice, with such entire satisfaction, that no consideration would induce me to adopt any other. Since 1847, I have kept from *thirty* to *thirty-five* head of milch-cows in this way; so that, in my mind, my experience is conclusive on the subject.

Every one of the advantages above stated, as being maintained by European writers, I have realized.

1. As to saving of land. *One* acre "soiled from" will produce as much as *three* acres pastured. This is enough; although some European writers assert the benefit is equal to *one* to *seven;* this great difference arising from the mode in which the one acre is cultivated and enriched for succulent products.

2. As to saving of fencing. It renders all interior fences useless. It enables the plough to pass through any length of land without turning; and saves all waste from headlands,

* The preceding Essay.

† I can now say to 1857, when I finally yielded my farm to my son.

which, on each side of fences, are usually the receptacles of unsightly and noxious weeds.

3. As to economy of food. Cattle will eat in the stall what they will reject in the field. They tread down and injure in the pasture, by dung or by stale, grass as good as, and almost in equal quantities with, that which they consume; and by their feet, injure its present product and future productive power.

4. As to the better condition and greater comfort of the cattle. In the stall, they are supplied every day, five or six times, with food given regularly in sufficient quantity; and, previous preparation having been made, they can never fail, let the season be what it will, of always having the best food, and enough. When kept in the pasture, they are left to their own care, subject to various accidents; to the ill effects produced by worrying one another; to the constantly varying state of the pasture, which is always effected by drought and by the proportion of the number pastured; and to the productive power of the field, which is often overstocked. In stall-feeding, care having been taken to have sufficient succulent food prepared, they are, in as great a degree as is possible, kept independent of the variations of season and from other annoyances. Their greater comfort, in this mode of keeping, is one of the essential causes of their better condition. During the heat of the day, they are kept under cover in the shade, secured from flies, from being worried by dogs or one another, from eating any noxious vegetables, and from bad water.

A popular objection to this mode of keeping milch-cows is, that want of exercise must affect injuriously the health of the animal. To this, European writers, some of whom have

kept in this way large herds, reply, that they "never had one sick, or one die, or one miscarry," in consequence of this mode of keeping. After more than ten years' pursuance of the same practice, my experience justifies me in uniting my testimony to theirs on this point.

Another commonplace objection to this practice, in respect of milch-cows, is, that their "milk cannot be so good, nor in so great quantities, for want of exercise." Nothing can have less foundation in fact. Cows in the pasture, unless under some temporary excitement, use very little, comparatively no, exercise. They usually walk a short time, slowly; collect their food, and lie down to ruminate. The difference between this habit of theirs, and the exercise obtained by walking about an hour or two hours in the day in a yard, and being employed in rubbing themselves against walls or posts, is little, if any, less than they get in the pasture. This exercise (a daily, thorough currying being added in their stalls) is quite as efficient to produce a healthful action of the system as any exercise, as it is called, in the pasture.

5. As to the quantity of milk produced by this mode of keeping, my own experience is, in my opinion, decisive in its favor. In early summer, and when pastures are fresh in grass, milk will be, for a short period, produced in somewhat greater quantities by keeping in pasture than by "soiling." But this advantage is of very short duration. As soon as pastures grow short, and the annoyance of heat and flies commences, all the advantage is transferred to stall-feeding. By comparison of the result of my milk produced with that of my neighbors', taking both parts of the summer season together, I am entirely satisfied that the product, by well-conducted "soiling," is greatly in favor of this process.

6. As to the great increase in the quantity and quality of the manure, there can be possibly no question on the subject. Proper receptacles for this article being provided, free from rain and the sun, into which the stale from the cattle may be also received, the quantity and increased value of the manure thus kept is, according to my experience, *a full equivalent for all the labor and expense of raising, cutting and bringing in the food, feeding, currying, and other care of the cattle.* No farmer need be told of the importance and absolute necessity of manure for successful farming; and, to those who have not the means of purchasing that article, the mode of "soiling" is, of all others, the most certainly productive of it, both in quantity and quality.

As to "my practice" in soiling, it relates, 1st. To the quantity of land to be cultivated for the purpose of preparing succulent food; 2d. To the particular articles to be thus cultivated; and, 3d. To the times they are to be sown, so as to effect a regular succession of such food.

1. As to the quantity of land to be cultivated. According to my experience, *one square rod of land*, of rich loam in high tilth in grass, oats, barley, or Indian corn, is enough for the support of a cow a day, if cut and delivered to her in the barn. As, however, there is a great difference in the state of land and in its productive power, and as it is important there should be no failure in succulent food, my practice has been to cultivate *one and a half square rods* of land per day for each head of cattle I intend to "soil;" and, on this basis, I make my calculations in the spring of the year. For the quantity to be sown at every succeeding period, when to secure a regular succession of such food a new sowing is required. To make this calculation sufficiently exact, the

length of time it will take the article sown to come to maturity so as to be fit to cut, and the length of time it will afterwards continue succulent, are to be considered. The time it comes to such a state of maturity is, of course, the time at which it may be relied upon for "soiling." A like reliance may be placed on the time it will continue succulent. The general knowledge of practical farmers and experience will easily give information on both points.

If any article sown in the spring will come to maturity on the 1st of July, and will continue succulent *ten* days, fifteen square rods of succulent food will be wanted for each cow "soiled." *One* cow will, therefore, consume fifteen square rods during that period; and *ten* cows will require one hundred and sixty rods, or about an acre of such food, for their support. On this basis of calculation, I have always found the number of square rods to be sowed, for such a period of succulency of the plant, is sufficient for about such a period of feeding; viz. *ten days*. On this calculation, I have safely "soiled" from *thirty* to *thirty-five* head of cattle; adding one acre of preparation for every *ten* head.

Should any one, however, adopt this practice for the first time, I should advise the preparing *two square rods* for each cow, to guard against every contingency to which a first attempt may be liable; for nothing will be lost, if the food should be proved more than was required. The surplus becomes a resource for the winter-keeping, after it is too rank for "soiling."

2. As to the particular articles to be thus cultivated. I have tried many besides those above mentioned; such as millet, lucern, cabbages, pease; the tops of carrots, beets, or turnips. Each may be usefully applied in its proper season,

particularly the three last. And whoever keeps milch-cows will find roots an important auxiliary for milk in the winter season; and, of course, will find their tops a like important aid to "soiling" in the latter months of autumn. But I think it best to enumerate only the fewest, the simplest, and the best known to all farmers, of the articles, which, from experience, I have found the surest and the best to be relied upon for a successful conduct of the system. These are those already enumerated, — oats, barley, and Indian corn, — sown broadcast or in drills, for fodder.

3. The time in which the above articles are to be sown.

The usual period in this country for turning out cows to pasture is from the 20th of May to the 1st of June. Antecedent to this period, no succulent food can be obtained for "soiling." Preparation, however, may be made, the autumn previous, by sowing winter rye, according to the proportion required for "soiling," from the 10th or 15th of the month of May to the 1st of June. This could be done with advantage; but I have never practised it more than once; because, although I have always had rye fit for cutting at this time, yet it is too valuable, as grain and straw, for me so to use it, — regarding as I do winter rye, at the usual prices of *grain and straw in this vicinity*, to be the most profitable of any grain product.

The reliance, in the "soiling" system, for succulent food, between the 20th of May and the 1st of July, is *grass*, cut and delivered in the stable; and, according to my experience, one and a half square rods per day for each cow "soiled" is ample for this purpose. The grass thus cut was usually that which is the least likely to be preferable for

winter keep; such as that growing by the side of my farm-roads or under trees, or that having the rankest fibre.

The food sown and cultivated for soiling, in this climate, must have exclusive reference to the summer and autumn months, commencing with the 1st of July. And the following is the order of sowing, according to my practice, justified by experience; the proportion of land sowed at each successive period being, as above stated, *one and a half or two square rods per day for each cow soiled.* To produce a sufficient quantity of succession of succulent food, sow —

1. As early in April as the state of the land will permit, — which is usually between the 5th and the 10th, — on properly prepared land, oats, at the rate of four bushels to the acre.

2. About the 20th of the same month, sow either oats or barley, at the same rate per acre, in like quantity and proportions.

3. Early in May, sow, in like manner, either of the above grains.

4. Between the 10th and 15th of May, sow Indian corn (the flat, Southern, being the best) in drills, three bushels to the acre, in like quantity and proportions.

5. About the 25th of May, sow corn in like quantity and proportions.

6. About the 5th of June, repeat the sowing of corn.

7. After the last-mentioned sowing, barley should be sown in the above-mentioned quantity and proportions, in succession, on the 15th and 25th of June, and on the 1st of or early in July; barley being the best qualified to resist the early frosts.

The results of the above sowing, in succulent food, may be

expected to be as follows, seasons of extraordinary drought excepted: —

The oats sowed early in April will be ready to cut for "soiling" between the 1st and 5th of July, and will usually remain succulent until the 12th or 15th of this month.

Those sowed about the 20th of April will be ready to cut between the 15th and 20th of July, and will last nearly or quite till the 1st of August.

Those sowed early in May will be ready to succeed the preceding, and last till about the 10th of this month.

The corn sown on the 10th and 25th of May and early in June will supply, in succession, succulent food, of the best quality, until early in September.

The barley sown in July will continue a sufficient supply until early in November; at which time, and often before, the tops of roots, carrots, beets, or turnips are a never-failing resource.

In the above enumeration of articles to effect a succession of succulent food for "soiling," I have carefully confined myself to those which were the fewest and the most commonly known. I have also stated their succession in point of sowing and use, that there may be no disappointment if no other articles can be brought in aid for the purpose: whereas, in the latter end of July and in August, second-crop grass may be generally relied upon; and, in September and October, the tops of roots, as above mentioned, and of Indian corn, are also a reliable resource.

I have also stated a succession of sowings, which my experience has shown to be full and sufficient, and which, if the quantity sowed should be equal to *two square rods* for each cow "soiled," per day, will certainly be more than sufficient

for summer "soiling." But, as before stated, if there should be excess, nothing is lost, as it becomes a resource for winter food for cattle.

I cannot close this communication without remarking upon the importance of this system, and of its being known and understood. Nothing seems less realized than the productive power of the soil, when it is good, arable, and well cultivated. A man hardly dares to call himself in our country, a farmer, unless he have thirty, forty, or fifty acres. If he have only ten, fifteen, or twenty, he aspires only to the character of a gardener; but as to keeping any number of cattle, beyond what is wanted for his own family use, he generally regards it wholly out of the question. Now, there is in our country no class of men whom it is more desirable to encourage and instruct in the actual productive power of the quantity of land they possess, than these *ten*, *fifteen*, or *twenty acre* men. As this class multiplies (as it must), it will become a most important element in preserving and perpetuating conservative principles in our institutions. The consciousness of an identity of interest between the small and the great landholder, is, in a republic, one of the strongest bonds of its continuance and happiness. A practical knowledge of the productive power of the soil, and of the mode of making its yield the most, will not only create in them content, but will prevent them from running into debt for more land, — a practice, of all others, the most embarrassing and ruinous to that class of farmers. That this class may obtain distinct and practical knowledge of the mode of operating on a small scale, on this system, I state that I have known *two* head of milch-cows kept in full milk and high condition, through the whole summer season,

on *one* acre of land, and some food from it left for winter use. To obtain the requisite succession of green food, *one quarter* of an acre was sown, of articles herein already stated, early in April; another *quarter* about fifteen days after the first; and so the remaining *two quarters* in similar succession.*

The first sown will be in a state to be used in "soiling" about the 1st of July; until which time, grass cut and brought to the stable is the reliance. From the 1st to the 15th of July, the food obtained from the first quarter of an acre will be usually a full supply. As soon as this quarter of an acre is fed off, it is to be well manured,—of which the cattle will have afforded an abundance,—ploughed, or spaded, and the articles above stated sowed, and rolled in. The same process is to be pursued in respect of every succeeding quarter of an acre, as soon as it is fed off, as long as the season will permit an expectation of a crop from such sowing.

Of course, a farmer upon such a small scale will have roots of some kinds—carrots, beets, turnips, or cabbages—

* In corroboration of these views, as an evidence of the usefulness of this practice on a small scale, I am authorized to state, that, *ten years ago*, the owner of *ten acres* of land in this vicinity, applicable to the cultivation of vegetables, corn, summer grass, and winter hay, for stock, complained that he could keep only *one cow*, and have hay enough remain for her winter food and for a horse. He was recommended to follow the plan suggested in this Essay, *on a single acre*: ploughing in succession, at the times there stated, so much of that acre as would support the cows he intended to keep, and following the other suggestions in ploughing and soiling; and each portion, as it was fed off, manuring and again ploughing, sowing and again feeding off. He adopted the recommendation, and has recently assured me, that *between the times of the first cutting of grass about his house and road-side, and the time of coming-in of vegetables for the food of stock, he has kept* TWO *cows, often* THREE, on this single acre; and has no doubt that he could have kept FOUR on that single acre, if he had wished, and had applied the system recommended,—pushed to the utmost of the productive power of that acre,—without affecting the requisite winter food of his stock; the cattle being all the time in health, and giving the usual proportion of summer's milk.

for winter supply, which will come in aid of the food of the one acre, if wanted at the last of the season. I have stated that *two* cows may thus be kept on one acre during the summer season. From my own experience, I do not hesitate to state that *three* cows may thus be kept in full milk and in high condition on a single acre. Whoever commences the system should begin on a small scale: experience will show the way to success. The great profit of the system is the abundance of manure which it insures, of the best quality, at the cheapest rate. The importance of manure to successful husbandry it is not for me to explain. Whoever has no funds to purchase it, will find no mode so sure, so cheap, and so easy to obtain it, as the system of "soiling."

# AN ADDRESS

DELIVERED BEFORE THE

## MASSACHUSETTS AGRICULTURAL SOCIETY,*

OCT. 12, 1819.

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THE Board of Trustees of the Massachusetts Society for promoting Agriculture have requested that I should address you, this day, on topics connected with the objects of their Institution and with the occasion. In acceding to their appointment, I have yielded to considerations of official duty. For the manner in which the task shall be executed, I need not apologize to practical and intelligent men, such as I have now the honor to address. They know well how difficult it is to cast over a trite subject the air of novelty, or to make one that is familiar interesting.

My purpose, this day, is to seek what is true and what is useful in relation to the interests of our agriculture.

In executing this purpose, I shall address myself chiefly to that great body of our countrymen who are emphatically called farmers: by which I mean the great body of Massachusetts yeomanry; men who stand upon the soil,

* Many suggestions contained in this Address, as originally published, are here omitted, forty years having greatly enlarged the knowledge, and improved the condition, of the farmers of Massachusetts.

and are identified with it (for there rest their own hopes, and the hopes of their children); men who have, for the most part, great farms and small pecuniary resources; men who are esteemed more for their land than for their money, more for their good sense than for their land, and more for their virtue than for either; men who are the chief strength, support, and column of our political society, and who stand to the other orders of the State as the shaft or the pillar; in respect of whom, all other arts, trades, and professions are but ornamental work, — the cornice, the frieze, and the Corinthian capital.

I am thus distinct in declaring my sentiment concerning the importance and value of this class of men, from no purpose of temporary excitement or of personal conciliation, but because I think it just and their due; and because, being about to hint concerning errors and defects in our agriculture, I am anxious that such a course of remark should not be attributed to any want of honor or respect for the farming interest. On the contrary, it is only from a deep sense of the importance of an art that a strong desire for its improvement can proceed. Whatever tends to stimulate and direct the industry of our farmers; whatever spreads prosperity over our fields; whatever carries happiness to the home, and content to the bosoms, of our yeomanry, — tends, more than everything else, to lay the foundations of our republic deep and strong, and to give the assurance of immortality to our liberties.

The errors and deficiencies of our practical agriculture may be referred, in a general survey, with sufficient accuracy, to two sources, — the want of scope of view among our farmers, and the want of system in their plans.

Concerning another want, of which farmers are most sensible, and most generally complain, — the want of cash in their pockets, — I shall say nothing, because it is not a want peculiar to the farmer. It is a general want, and belongs to all other classes and professions. Besides, there is no encouragement to speak of this want, because it is one that increases by its very supply. All of us must have observed, that it almost ever happens (with, however, a few splendid exceptions), that the more any man has of this article, the more he always wants.

The errors and deficiencies to which I shall allude will not be such as require any extent of capital to rectify. All that will be requisite is a little more of that industry of which our farmers have already so much, or that industry a little differently directed. It is not by great and splendid particular improvements that the interests of agriculture are best subserved, but by a general and gradual amelioration. Most is done for agriculture when every farmer is excited to small attentions and incidental improvements; such as proceed, for instance, from the constant application of a few plain and common principles. Such are, that, in farming, nothing should be lost, and nothing should be neglected; that everything should be done in its proper time, everything put in its proper place, everything executed by its proper instrument. These attentions, when viewed in their individual effect, seem small; but they are immense in the aggregate. When they become general, taken in connection with the dispositions which precede, and the consequences which inevitably follow, such a state of improvement, they include, in fact, everything.

Scope of view, in a general sense, has relation to the

wise adaptation of means to their final ends. When applied to a farmer, it implies the adaptation of all the buildings and parts of a farm to their appropriate purposes; so that, whatever is fixed and permanent in its character, may be so arranged as best to facilitate the labor of the farm, and best to subserve the comfort, convenience, and success of the proprietor.

Our ideas upon this subject may be best collected from inspection. If our fellow-farmers please, we will therefore, in imagination, adjourn for a few moments, and take our stand, first, at the door of the farm-house. I say, "at the door." Far be it from me to enter within it. Far be it from me to criticise the department of the other sex, or to suggest that anything peculiarly subject to their management can be either ameliorated or amended. Nor is it necessary; for I believe it is a fact almost universally true, that, where the good man of the family is extremely precise and regular and orderly in his arrangements without doors, he never fails to be seconded, and even surpassed, by the order, the regularity, and neatness of the good woman within.

Let us cast our eyes, then, about us, from the door of the farm-house. What do we see? Are the fences on the road in good condition? Is the gate whole, and on its hinges? Are the domestic animals excluded from immediate connection with the dwelling-house, or at least from the front-yard? Is there a green plot adjoining, well protected from pigs and poultry, so that the excellent housewife may advantageously spread and bleach the linen and yarn of the family? Is the woodpile well located, so as not to interfere with the passenger? or is it located with especial eye

to the benefit of the neighboring surgeon? Is it covered, so that its work may be done in stormy weather? Is the well convenient? and is it sheltered, so that the females of the family may obtain water, without exposure, at all times and at all seasons? Do the subsidiary arrangements indicate such contrivance and management as that nothing useful should be lost, and nothing useless offend? To this end, are there drains, determining what is liquid in filth and offal to the barnyard or the pens? Are there receptacles for what is solid, so that bones and broken utensils may occasionally be carried away and buried? If all this be done, it is well; and if, in addition to this, a general air of order and care be observable, little more is to be desired: the first proper object of a farmer's attention (his own and his family's comfort and accommodation) is attained. Everything about him indicates that self-respect which lies at the foundation of good husbandry as well as of good morals.

As we proceed to the farm, we will stop one moment at the barnyard. We shall say nothing concerning the arrangements of the barn. They must include comfort, convenience, protection for his stock, his hay, and his fodder, or they are little or nothing. We go thither for the purpose only of looking at what the learned call the stercorary, but which farmers know by the name of the manure-heap. Will our friends from the city pardon us if we detain them a moment at this point? Here we stop, the rather because here, more than anywhere else, the farmers of Massachusetts are careless and deficient; because on this, more than on anything else, depends the wealth of the farmer; and because this is the best criterion of his present, and the surest pledge of his future, success. What, then, is its state?

How is it located? Sometimes we see the barnyard on the top of a hill, with two or three fine rocks in the centre; so that whatever is carried or left there is sure of being chiefly exhaled by the sun, or washed away by the rain. Sometimes it is to be seen in the hollow of some valley, into which all the hills and neighboring buildings precipitate their waters. Of consequence, all its contents are drowned or water-soaked; or, what is worse, there having been no care about the bottom of the receptable, its wealth goes off in the under *strata*, to enrich, possibly, the antipodes. The Chinese, for aught we know, may be the better for it; but it is lost forever to these upper regions.

Now, all this is to the last degree wasteful, absurd, and impoverishing. Too much cannot be said to expose the loss and injury which the farmer thus sustains. Let the farmer want whatever else he pleases: but let no man call himself a farmer who suffers himself to want a receptacle for his manure, water-tight at the bottom, and covered at the top; so that, below, nothing shall be lost by drainage; and, above, nothing shall be carried away by evaporation. Let every farmer, wanting such a protection for his manure, be assured that he loses, by the sun and rain, tenfold as much as will pay all his taxes — State, town, and national — every year. Let not the size of his manure-heap be any objection. If it be great, he loses the more, and can afford the expense the better. If it be small, this is the best way to make it become greater. Besides, what is the expense? What is wanted? An excavation, two or three feet deep, well clayed, paved, and "dishing," as it is called, of an area according to the desired quantity of manure; overhead, a roof made of rough boards and refuse lumber, if he pleases;

the object being to shut out the action of the sun and cast off the rain, so that no more should come upon his manure-heap than the farmer chooses. This he regulates, by spouts, at his discretion.

Time will not permit us to stay long upon the farm: we will go out upon it only for the purpose of making a single observation, and that in relation to the fences.

It is thought to be a great virtue in a farmer to build good fences. And so it is. None can be greater, so far as relates to external fences, — those which bound on the road or a neighbor. They ought to be perfect, and sufficient against every intrusion. But, when the remark is applied to interior fences, it is often far otherwise. The making, and keeping in repair, unnecessary fences, is one of the greatest drawbacks from the profitable employment of the labor of our farmers. Every year, new fencing-stuff must be bought, or stone walls must be built, and stone walls repaired. Much of that time and capital are expended about these objects which ought to be employed in collecting manures, in ploughing their land, or in some labor directly conducing to the prosperity of the immediate or ensuing crop.

The adopting of a single principle, in relation to the management of their farms, would save at once one half of all their interior fences. I allude to the making the distinction between arable and pasture lands permanent; and adopting it as a principle, that no beasts should be permitted to range upon the soil destined to the plough and the scythe.

I know that this proposition will be received by many with surprise, and by some with a sneer. But consider of

it, farmers. Be assured that the practice of grazing your mowing-lands is the falsest of all that bears the name of economy. It is impossible, in a discourse so general as this necessarily is, to give all the grounds of this position. I look at the subject now only in relation to saving the expense of making fences and repairing them. Let any farmer, of middle age, take his pencil, and calculate what it has cost him and his ancestors, in the course of his and their lives, to make and maintain rail-fences or stone-walls upon their farms. I am mistaken if one half of the farmers do not find the expense far exceed their present conception; and if the other half do not find, that, at a fair estimate of materials, labor, and interest, the cost of these fences or walls has been more than the whole farm would now sell for under the hammer.

Now, more than half of all the stone-walls and rail-fences in Massachusetts are interior fences, dividing lands belonging to the same proprietor. These interior fences are absolutely useless, except for the purpose of enabling the proprietor to pasture his mowing-land. They are worse than useless on exclusively arable land. These walls are, in fact, harbors for all sort of vermin; for field-mice and woodchucks and skunks and squirrels. Then, on both sides, what a rare assemblage always of elderberries and barberry-bushes and nettles, and all sorts of injurious weeds! Thus not only much land is lost, but worse than lost. There is done a positive injury. Besides, when the plough begins to run, what then? Why, upon many farms, you cannot run a plough forty rods in a straight line, without coming, as farmers say, "plump" upon a stone-wall. Then what a "hawing and jeeing"! And the good-natured fellow at

the front-yoke must always take time to crack his joke, or have "a cup of comfort" with the good-natured fellow at the plough-tail; and all this at the direct and positive loss of the owner of the land or the employer.

But our lands are full of stone. What shall we do with them? Certainly there is no absolute necessity of building them up in the shape of a stone-wall. If there be, then thicken or heighten your external walls. But this is done already. Well, then, have you never a pond-hole to fill up? Is there no useless hollow into which they may be thrown? If nothing of this kind can be done with them, better pile them up pyramidically, and cover them with grape-vines, than go to the expense of building walls worse than useless.

Let me not be understood to intend that good farming requires that farmers should level or remove the walls or fences which they or their ancestors' labor have already provided. The condition of every man's farm is, in this respect, a particular fact, by which the calculations of his business should be made, and his conduct in relation to it governed. The only object of these remarks is to invite farmers, who are contemplating building new walls, or purchasing new materials for interior fences, to consider whether their own and oxen's labor may not be better employed; and whether grazing the land, intended to be fenced, be, in fact, a compensation for the great expenditure they are about to incur, — of the only capital they have, generally, at their command.

Farmers should never one moment forget that their and their oxen's labor constitute their capital, and that they should be wasted in no object which does not add something to the present or future year's actual product. It is not too

much to say, that the capital expended in rail-fences and stone-walls which are useless, in Massachusetts, would, if it had been applied in collecting manures and in deepening the soil, have added, at this day, a third part to the income of every farmer in the country.

Let every farmer divide his pasture-ground as he pleases; let the fence between his arable and pasture land be as strong as an external fence: but, if possible, let all his arable ground, though a hundred acres, be in one lot. Then his plough runs clear in a long furrow. His tillage is divided only by the different species of grain and vegetables he cultivates. There are no fences; of consequence, no inconvenient and worthless headlands; no apology for thistles and nettles. The scene is beautiful to the eye. The whole has the appearance of a garden, and begets in the farmer a sort of horticultural neatness.

Before passing to treat, very briefly, the remaining topic of discourse, may I be permitted to say a word on the style of our buildings? It will be worth the time, if it make only one man, about to build, consider.

The fault is not peculiar to farmers, — it is true of men in almost every rank and condition of life, — that, when about to build, they often exceed their means, and almost always go beyond the real wants of their families, and the actual requisition of their other relations in life. But let not the sound, practical good sense of the country be misled by the false taste and false pride of the city, where wealth, fermenting by reason of the greatness of its heaps, is ever fuming away in palaces, the objects of present transitory pride, and too often of future, long-continued repentance.

When will man learn that his true dignity, as well as

happiness, consists in proportion, — in the proportion of means to ends, of purposes to means, of conduct to the condition in life in which a kind Providence has placed him, and to the relations of things concerning which it has destined he should act?

The pride of the farmer should be out in his fields. In their beauty, in their order, in their product, he should place the gratification of his useful and honorable ambition. The farmer's great want is capital. Never should his dwelling be splendid at the expense of his farm. In this, all that is surplus in his capital should concentrate. Whatever is uselessly expended elsewhere is so much lost to his family and his fortune.

I shall now recur briefly to another class of deficiencies, — the want of system in the plans of our farmers.

System relates to time, to courses, and to modes of husbandry. A full elucidation of each topic would embrace the whole circle of farming dispositions and duties. The time will not permit anything more than a recurrence to one or two leading ideas. Want of system in agriculture leads to loss of time and increase of expense. System has chief reference to succession of crops, to sufficiency of hands, and to selections of instruments. As to the succession of crops, called rotation, almost the only plan of our farmers is to get their lands into grass as soon as possible, and then to keep them in grass as long as possible. The consequence of this practice — for it deserves not the name of a system — is to lead to the disuse, or rather to the least possible use, of that great source of agricultural riches, — the plough. Accordingly, it has almost become a maxim, that the plough is the most expensive of all instruments; and of consequence, as

much as possible, to be avoided. And so it is, and so it must be, as the business of our farms is managed. By keeping lands down to grass as long as possible, — that is, as long as the hay product will pay for mowing and making, — the consequence is, that our lands, when we are obliged reluctantly to put the plough into them, are bound and matted and cross-barred with an impervious, inextricable, infrangible web of root and sod. Hence results a grand process, called "a breaking-up," with four, five, or six head of cattle, as the case may be, with three men, one at the ox-head, a second at the plough-beam, and the third at the plough-handle. Is there any wonder that such a ploughing apparatus is an object of aversion?

It is impossible for any man to witness "a breaking-up" of this kind, without being forcibly reminded of the reflection made by a shrewd commentator on that passage in the Book of Kings where it is said that Elisha was found "ploughing with twelve yoke of oxen." — "Well," said the commentator, "it is no wonder that Elisha was glad enough to quit ploughing for prophesying, if he could not break up with less than twelve yoke of oxen."

In fact, the plough is the natural instrument of the farmer's prosperity; and the system of every farmer ought to have reference to facilitating and increasing its use. Let a rotation be adopted, embracing two or three years' successive ploughings, for deepening and pulverizing crops, to be succeeded by grain and grass for two or three years more. The plough, on its return every five, six, or seven years, finds, in such case, the land mellow, soft, unimplicated by root, and tender in sod. The consequence is, that "a breaking-up" is then done with one yoke of oxen and one man.

The expense is comparatively small. There is nothing to deter, and everything to invite, the farmer to increase the use of that most invaluable of all instruments.

Systematic agriculture also requires sufficiency of hands. Whatever scale of farming any man undertakes to fill, hands enough to do it well are essential. Although this is a plain dictate of common sense, yet the want of being guided by it in practice is one great cause of ill success in our agriculture. Because we hear every day that "labor runs away with all profits in farming," almost every farmer lays it down as a maxim, to do with as little labor as possible. Now, this maxim almost always results in practice in doing with less than he ought. The effect is almost everywhere seen, in loss of time, loss of season, loss of the employ of working cattle, and loss or deterioration of crop. Now, in truth, labor, as such, never yet diminished any man's profit: on the contrary, it is the root and spring of all profit. Labor unwisely directed and unskilfully managed is, indeed, a great consumer of the farmer's prosperity; but labor wisely directed and skilfully managed can, from the nature of things, result in nothing else than profit. What is skilful management, and what is wise direction of labor, opens a field almost boundless, and not to be attempted on the present occasion. A single remark must suffice. The great secret of European success in agriculture is stated to be "much labor on comparatively little land." Now, the whole tenor of Massachusetts husbandry, from the first settlement of the country, has been little labor on much land. Is it wonderful, then, that success should be little or nothing, when conduct is in direct violation of the principle on which success depends?

With respect to utensils, too, system requires that they should be the most perfect of their kind, and always the most perfect in their state.

* Great profits in agriculture can result only from great improvements of the soil: great improvements of the soil can result only from unremitting industry. The chief study of every farmer should be, *what is useful and what is useless expense in relation to his art.* The discrimination between these is the master key of the farmer's prosperity. The first should be incurred with a freedom little short of profusion: the last should be shunned as the sailor shuns the rocks where are seen the wreck of the hopes of preceding mariners.

In this art, and almost in this art alone, "it is the liberal hand which maketh rich."

Liberality in providing utensils is the saving both of time and of labor. The more perfect his instruments, the more profitable are they.

So also is it with his working cattle and his stock: the most perfect in their kinds are ever the most profitable.

Liberality in good barns and warm shelters is the source of health, strength, and comfort to animals; causes them to thrive on less food, and secures from damage all sorts of crops.

Liberality, also, in the provision of food for domestic animals, is the source of flesh, muscle, and manure.

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* I am indebted, partly, for the general turn of thought, and for some of the expressions, in a few of the ensuing paragraphs, to a work entitled "Arator," by John Taylor, Esq., of Caroline County, Va., — a work principally destined to ameliorate the agriculture of the State of which the author was a citizen; but written, so far as it relates to its agricultural tendency, in an admirable spirit, and abounding in reflections at once practical and philosophical.

Liberality to the earth, in seed, culture, and compost, is the source of its bounty.

Thus it is, in agriculture as in every part of creation, a wise and paternal Providence has inseparably connected our duty and our happiness.

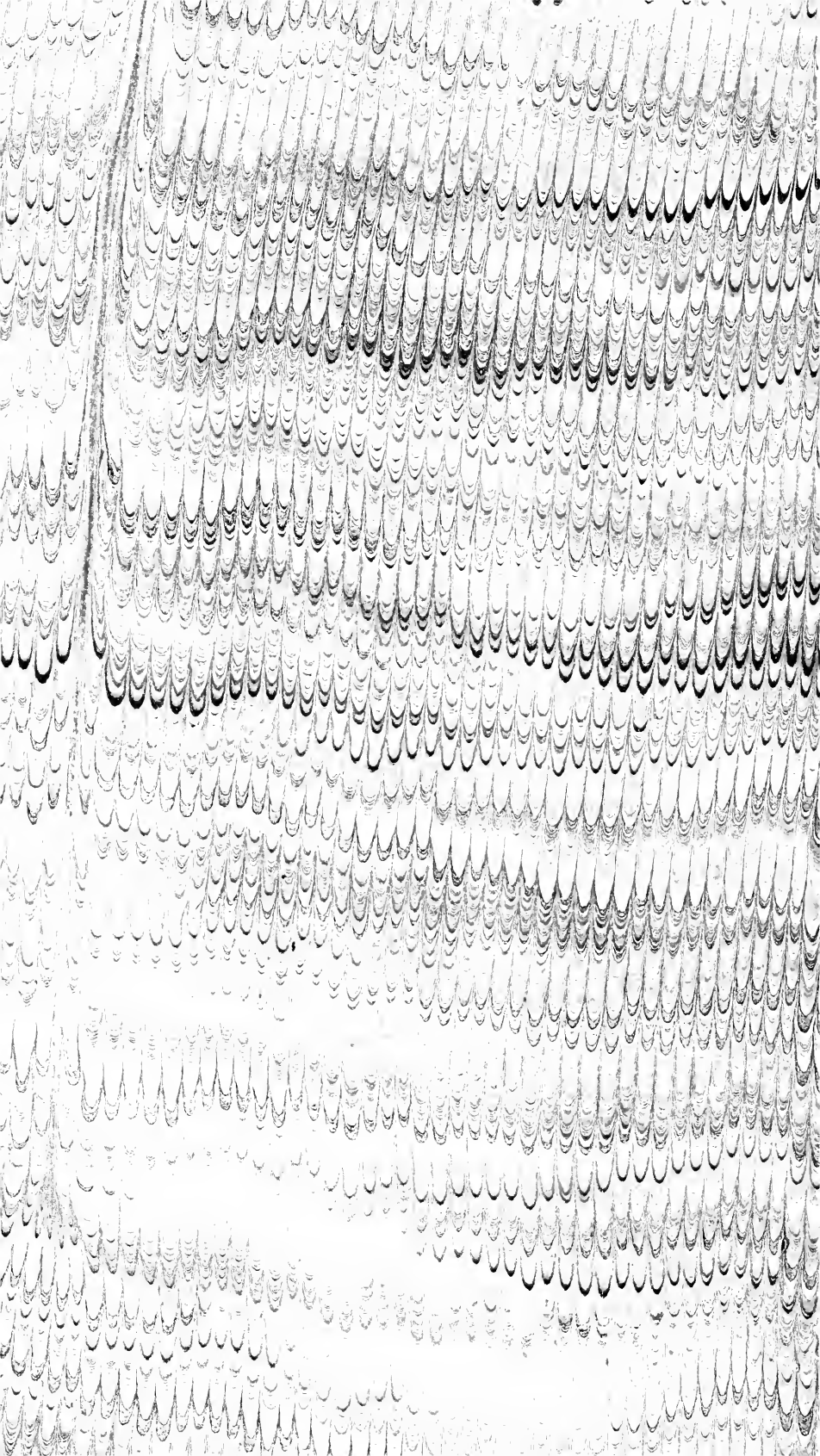
In cultivating the earth, the condition of man's success is his industry upon it.

In raising domestic animals, the condition of his success is kindness and benevolence to them.

In making the productiveness of the earth depend upon the diligence and wisdom of the cultivator, the Universal Father has inseparably connected the fertility of his creation with the strongest intellectual inducements and the highest moral motives.

In putting the animal world under his dominion, he has placed the happiness of which their nature is susceptible under the strong guaranty of man's interest.

Instead, therefore, of repining at his lot, let the cultivator of the ground consider his as among the highest and happiest of all human destinies: since, in relation to the earth, he is the instrument of Heaven's bounty; and, in relation to the inferior orders of creation, the almoner of Providence.



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